A STRATEGY FOR COMPUTING DISEASE AND NON-BATTLE INJURY RATES

W. M. PUGH

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NAVAL HEALTH RESEARCH CENTER
P.O. BOX 85122
SAN DIEGO, CALIFORNIA 92186-5122

NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
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William M. Pugh

Medical Decision Support Department
Naval Health Research Center
P.O. Box 85122
San Diego, CA 92138-9174

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Summary

The Naval Health Research Center has initiated an effort to compute the Disease and Non-Battle Injury (DNBI) rates needed to determine the medical requirements for Navy and Marine Corps personnel afloat and ashore. A data base has been compiled which includes information on all hospital admissions since 1965, information on outpatient visits, monthly morbidity reports, service history data, environment data, and deployment information. In addition, more outpatient data are being collected with a Patient Encounter Report designed to document specific diagnoses, treatments, and, the disposition of each patient. These data will be used to document current DNBI rates and project rates for situations in which no data are available, to extrapolate geographic and temporal trends, and estimate the effect of different levels of combat intensity. The approach taken in this effort started by specifying the population in terms of a person's duty station. Therefore, determination of population strengths, which is often a problem, can be accomplished by extracting information from available service history records.

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Medical planners need an estimate of the total patient load for a combat scenario before they can determine medical resource requirements. However, it is useful to derive separate estimates for the number of patients Wounded In Action (WIA) and the number of patients treated for Disease and Non-Battle Injury (DNBI) in a population, and to convert these quantities to WIA and DNBI rates per 1000 men per day. Separate WIA and DNBI rates are used because they tend to reflect different sources of variation. WIA rates are a direct function of combat intensity and are indirectly related to environmental factors while DNBI rates vary as a direct function of environmental factors and as an indirect function of combat intensity or operational tempo. Moreover, a single factor may have very different effects on WIA rates versus DNBI rates. For example, poor weather conditions may lead to an increase in disease but interfere with combat operations and thus result in a decrease in combat casualties, or extremely high levels of combat intensity may result in high casualty rates and low DNBI rates. The discussion in the current paper will concentrate on methods for determining DNBI rates.

The Naval Health Research Center's effort to determine DNBI rates has focused on three theaters of operation; Europe, Northeast Asia, and Southwest Asia. In addition, each of these populations have been divided into Navy and Marine Corps sub-groups which, in turn, have been separated into forces afloat and forces ashore. For each of the resulting subpopulations, separate Disease and Non-Battle Injury (DNBI) rates are being computed. The initial work involved the location and acquisition of historical data, and the creation of a DNBI data base. Then, these data were augmented by the collection of current illness and injury data, and a system for keeping the DNBI data base up-to-date was developed. Currently, methods are being devised for projecting DNBI rates to a wide range of situations from the information in the DNBI data base.

Historical Data: Computation of DNBI rates for the designated subpopulations requires that the necessary medical data, strength data, and environmental data be collected and analyzed. To accomplish this task, information was drawn from a variety of sources and organized within the DNBI data base. For individual patients, medical information was extracted from computerized files maintained at NHRC on all hospital admissions since 1965. In addition, computer files were obtained for outpatient visits from selected Navy ships deployed between 1968 and 1979. The population information was acquired from service history files. These data included information on the patients' age, sex, birthdate, and duty station. Environmental data includes information about the ship, such as ship location data from deck logs and ship profile information from Janes Fighting Ships[1]. At the present time, data have been collected from each of these sources and organized into individual records as shown in figure 1.

Initial analysis of the historic data concentrated upon a set of ships for which data on individual outpatient visits were available. Rates of DNBI outpatient visits were computed using location information from each ship's deck log and by processing data contained in the service history file to determine the number of men aboard each ship. Hospital admission rates were found for the same population by extracting from the medical history file the admission records for individuals aboard the ships providing outpatient data. This way hospital admission rates for geographic areas could be calculated using the location and strength data obtained for the computation of outpatient visit rates. DNBI rates computed from available historical data have been reported by Blood, Pugh, Griffith, and Nirona[2].

The above analyses not only provide some initial DNBI statistics, they suggest a method for computing DNBI rates on a routine basis. By targeting the patients' reporting facility as the unit of analyses, a population can be defined by specifying the reporting facilities to be considered. Once a population is defined this way, the denominator can be found (crew strength) and a ship's location can be retrieved. For numerator information, hospital admissions can be extracted from medical history tapes, and outpatient data can be obtained from Monthly Morbidity reports completed by each Navy treatment facility. Therefore, a record can be created for each duty station for each month. Such records contain information on the number of illnesses and injuries that occurred, the number of people onboard, and the location of the unit. The conceptual organization of these data is shown in figure 2.

With regard to the outpatient data, however, it should be noted that the Monthly Morbidity reports present a number of problems. First, they are compiled by treatment facility - not by that patient's duty station. So, for shore facilities, and possibly some of the large ships, the catchment area is ill defined. However, for many ships treatment facility and duty station are nearly synonymous, at least while the ship is deployed. Second, Navy and Marine Corps visits are combined. Third, rather than documenting data in an on-going fashion, completion of these reports requires the visits for the past month to be reviewed and summarized. Such a procedure is very susceptible to recording errors. These problems can be avoided, however, by gathering data upon each patient visit. Then the information can be processed to generate tallies by treatment facility, duty station, or branch of service.

Current Data Sampling: The available data base contains a large amount of data on individual hospital admissions and monthly totals for outpatient clinics but very little information on individual outpatient visits. Therefore, to augment the historical sources of data, the collection of outpatient data was initiated. Outpatient information is of interest because there are conditions requiring aggressive treatment and bed rest that are treated at forward echelons and never become a hospital admission. Consequently, it is useful to monitor outpatient visits and the disposition of those visits to determine which encounters resulted in the patient being returned to duty, returned to limited duty, kept in quarters, hospitalized, or evacuated. Finally, by collecting outpatient information upon each patient visit, it is possible to accumulate the data for any subpopulation of interest.

A patient encounter form was devised to expedite the outpatient data gathering process and minimize the administrative impact on the medical clinic. This form (shown in figure 3) was used to collect identifying information, demographic data, diagnosis, treatment, and disposition information for each patient visit. To reduce the time required by medical personnel, the form was designed so the patient could complete the identifying and demographic items. Further, the remaining portions of the form were designed so they could be completed by the corpsman or physician through the selection of appropriate items from lists that were provided. The design and use of this form is discussed in detail by Hermansen and Wilcox [3].

These outpatient forms were used to collect data from 12 ships and three shore facilities. The forms were processed monthly. The data from each form was entered into the DNBI data base. Accumulating these data by the patients' duty station for each month generated the information needed to compute DNBI rates. Accumulating these data by treatment facility produced monthly patient load statistics which were forwarded to the Navy Medical Data Services Center in the format shown in figure 4.

Projection. Although useful and interesting information can be retrieved from the DNBI data base, the possibilities for using the available data for projecting future outcomes are more exciting. First, statistical estimation techniques can be used to compute rates for environments for which no data have been collected and for situations that have never occurred. This is accomplished by combining data from two or more sources to predict the outcome when the combined event occurs. For example, the population of interest could be Navy men aboard minesweepers in the Persian Gulf. If no data on that population are available, one might use information about Navy men versus Marine Corps men along with information about Marine Corps personnel in the Persian Gulf. In such a situation, the available data would be used to make a series of adjustments to average DNBI rates. The information about Marine Corps personnel in the Persian Gulf would be adjusted for any overall differences between the Navy and Marine Corps to generate an estimate for the Navy men in the Persian Gulf. Then historic differences in illness rates among ship types could be used to further adjust this estimate to arrive at the DNBI rate for Navy men aboard minesweepers in the Persian Gulf.

This type of estimation is performed using a comprehensive statistical model that specifies all variables within the DNBI data base which are related to variations in DNBI rates. In addition, the model specifies whether each variable has a primary (main) effect, a second order effect (two-way interaction), or a third order effect (three-way interaction). Then, when a target population is specified prediction weights for those variables needed to define the population are extracted from the data base and all other effects in the overall equation are set to zero. Summing the separate effect score, then, yields a projected DNBI rate for the target population. A detailed explanation of this statistical projection method is provided by Pugh [4].

A second type of projection that can be performed using the DNBI data base is the extrapolation of trends. This type of projection would be relevant to the geographic and temporal spread of infectious diseases. A study currently in progress, was undertaken to determine how frequently illness data must be sampled to detect temporal trends, where data must be obtained to detect geographic trends, and which Navy and Marine Corps facilities should be monitored. Results will be used to recommend a program of sampling outpatient visits to Navy medical clinics so that temporal and geographical illness patterns can be detected, followed, and ultimately anticipated.

A third type of projection is the estimation of DNBI rates under various levels of combat intensity. Clearly, the difficulty in projecting from available DNBI data to wartime operations and high combat intensity situations results from the paucity of available medical information from combat situations. However, some data do exist [5,6,7] which can be used to estimate DNBI rates during wartime. An algorithm for projecting the wartime rates from peacetime data can be developed by simply building a prediction equation using the peacetime data to calculate all prediction parameters. This peacetime equation would then be used to predict the wartime rates. If the peacetime equation systematically underestimates the actual wartime rates, then the amount of bias can be measured and used to adjust peacetime data to reflect wartime circumstances. For example, if the peacetime projections were too low by 1.5 cases per 1000 men per day, then it would be concluded that peacetime projections need to be increased by a factor of 1.5 cases per 1000 men per day to obtain an estimate for wartime.

When projecting to combat scenarios, the feasibility of separating estimates of wartime rates into five levels of combat intensity will be investigated. The current definitions of Intense Combat, Heavy Combat, Moderate Combat, Light Combat, and No Combat are being revised to form a Navy relevant scale. Experts are being asked to provide a Navy- specific definition for each level. Historic events will be classified using the revised definition. Finally, a projected rate for each level of intensity will be determined in the manner described above. That is, predicted scores for each level of intensity will be generated from a peacetime model, and the difference between the predicted rates and actual wartime rates will be used to determine an adjustment factor for each level of Combat Intensity.

Summary and Conclusions. Many efforts to compute illness and injury rates go awry because they start with the documentation of patient visits at a clinic or hospital. From this information, a frequency count of all patient visits for a given period of time is obtained. However, this approach is doomed to failure because the population cannot be defined. Even with unlimited resources one cannot compose a roster of people who are the potential patients for a given clinic during a specific period of time. For instance, when a ship makes a port call, individuals from the ship may go to the clinic aboard the ship, to a shore-based clinic, or both.

The strategy taken to avoid this pitfall starts by defining the study population first. Specifically, those individuals assigned to selected duty stations. A second part of the strategy is the documentation of each patient visit. The patient encounter forms can be tallied according to treatment facility to meet the requirement to compile patient load statistics, and they can be sorted and counted by the patient's reporting facility to provide denominator data for illness rate computations. A third aspect of the strategy is the use of a representative sample to determine population trends. Furthermore, there is no need to collect data from all reporting facilities to estimate DNBI rates for a specific population when a representative sample formed by selecting certain reporting facilities can provide the same information. Finally, the tack taken to extrapolate from peacetime to wartime estimates is to view the state of combat as a factor that may increase or decrease the DNBI rate with respect to the peacetime levels. This factor, then, is assessed by finding the difference between DNBI rates that occurred during periods of combat and projected peacetime rates.

On the one hand, one must abandon some illness data to obtain valid DNBI rates. Only illness data for which strength information is available can be used. On the other hand, the acquisition of new data and the updating of the DNBI data base must be an ongoing process so that illness trends can be followed.

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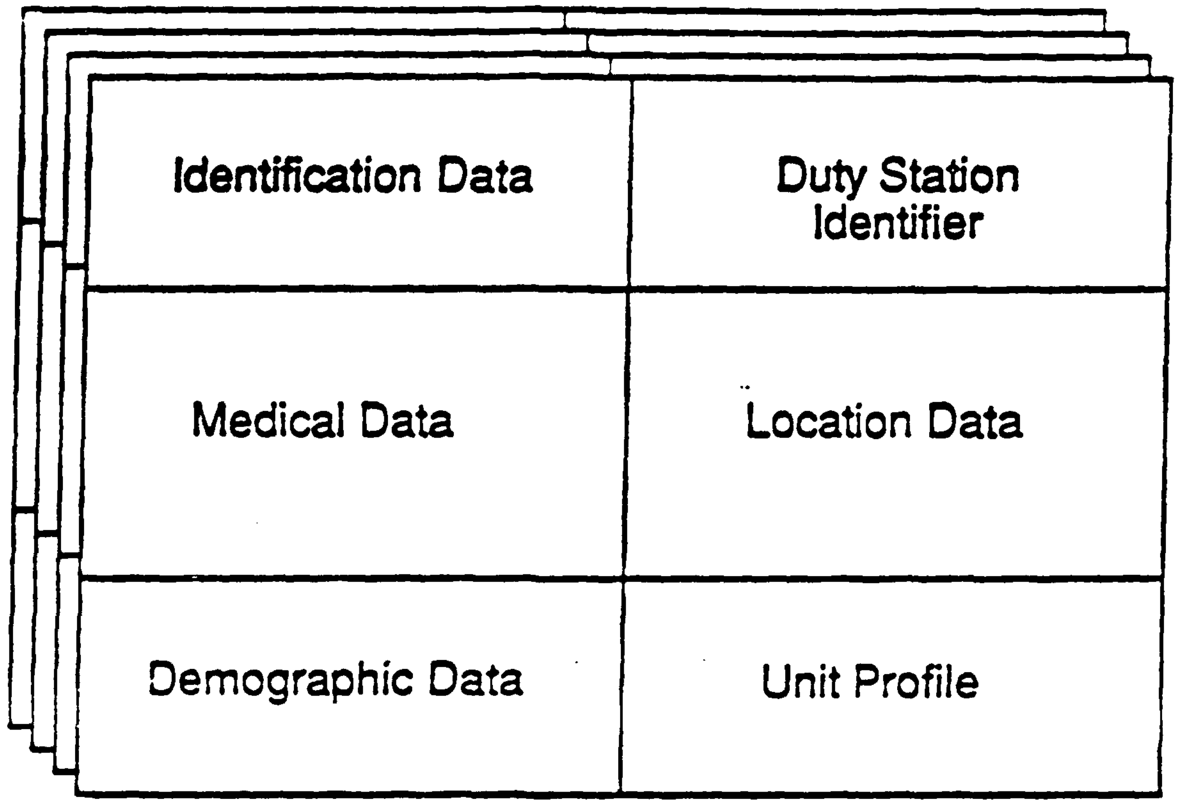

Figure 1. Conceptual Organization of the Individual Level File

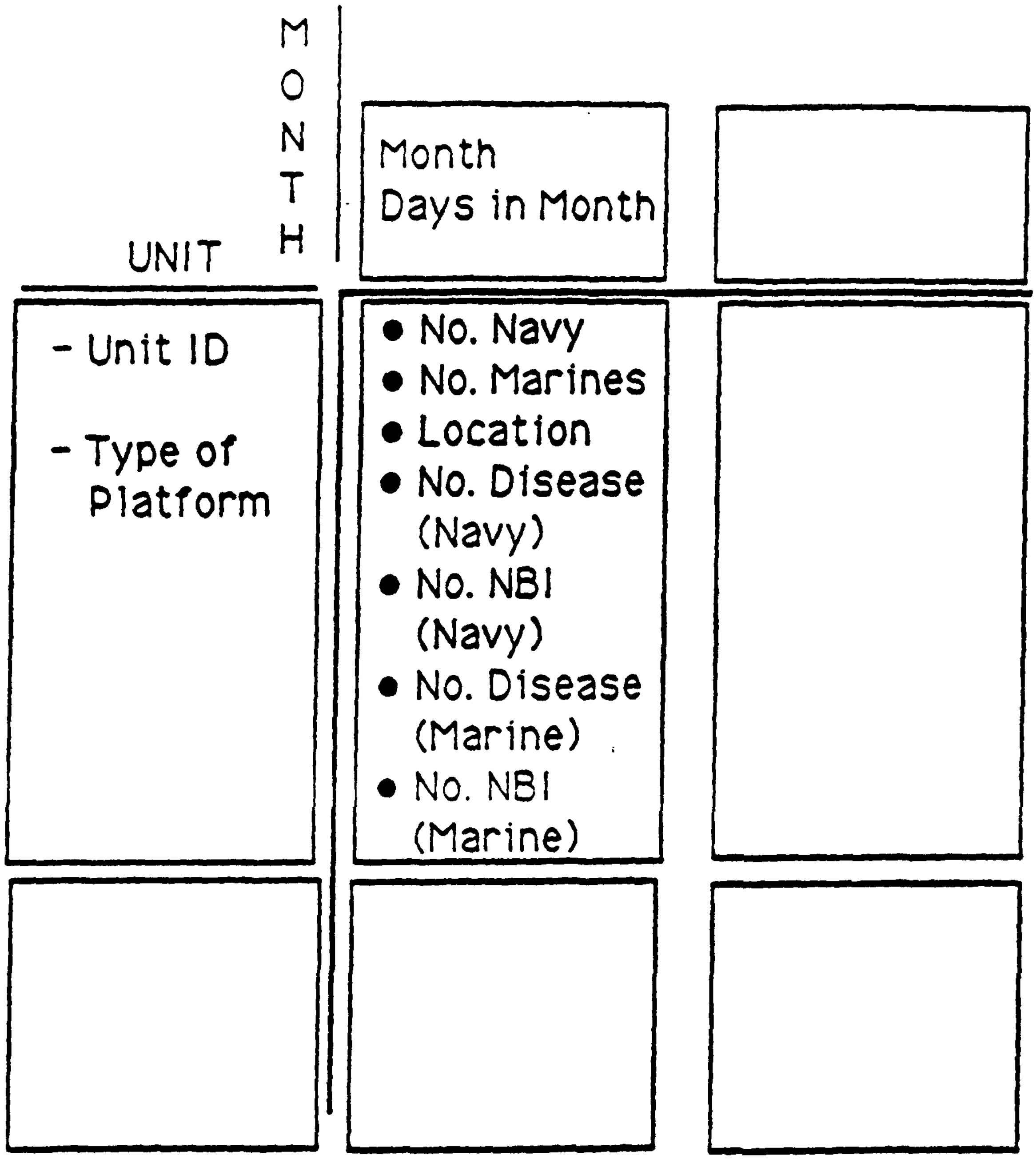

Figure 2. Conceptual Organization of the Unit Level File

I. PATIENT INFORMATION

TODAY'S DATE (MM/DD/YY) __ __ / __ __ / __ __ | NAME (LAST, FIRST, M.I.) | SOCIAL SECURITY NUMBER __ __ __ __ __ __ __ __ __

BIRTHDATE (MM/DD/YY) __ __ / __ __ / __ __ | BRANCH OF SERVICE ☐ NAVY ☐ MARINE CORPS ☐ OTHER ______ | PAY GRADE E ____ O ____ W ____

SHIP NAME/DUTY STATION | STATUS ☐ ACTIVE DUTY ☐ OTHER ______ | SEX ☐ MALE ☐ FEMALE

VISIT NUMBER FOR PRESENT PROBLEM ☐ 1 ☐ 2 ☐ 3 ☐ 4 OR MORE | IF INJURED ☐ ON DUTY ☐ OFF DUTY | WHERE? ☐ ASHORE ☐ ABOARD

WAS INJURY CAUSED BY ☐ MOTOR VEHICLE ☐ BATTLE CASUALTY ☐ OTHER | TREATMENT FACILITY | TYPE (CHECK ONE) ☐ HOSPITAL ☐ BAS ☐ SICK BAY ☐ BRANCH CLINIC

II. SIGNS, SYMPTOMS, AND DIAGNOSES

RESPIRATORY:

☐ 450 URI
☐ 447 PHARYNGITIS
☐ 448 TONSILLITIS
☐ 452 INFLUENZA
☐ 464 BRONCHITIS
☐ 466 ASTHMA
☐ 446 SINUSITIS
☐ 483 OCCUPATIONAL INHALATION DISORDER
☐ 459 PNEUMONIA
☐ 474 RHINITIS
☐ OTHER SPECIFY ______

GASTROINTESTINAL:

☐ 512 ACUTE GASTROENTERITIS/COLITIS
☐ 498 ULCER
☐ 010 DIARRHEA
☐ 52008 CONSTIPATION
☐ 505 APPENDICITIS
☐ 005 ACUTE BACILLARY DYSENTERY
☐ OTHER SPECIFY ______

MUSCULOSKELETAL:

☐ 665 TENDONITIS
☐ 658 JOINT DERANGEMENT
☐ 659 INTERVERTEBRAL DISC DISORDER
☐ OTHER SPECIFY ______

BEHAVIORAL:

☐ 27401 ANXIETY
☐ 287 SITUATIONAL DISTURBANCE
☐ 280 DRUG ABUSE
☐ 278 ALCOHOL ABUSE
☐ 27407 DEPRESSION
☐ OTHER SPECIFY ______

EYE/EAR:

☐ 357 OTITIS EXTERNA
☐ 358 OTITIS MEDIA
☐ 337 CONJUNCTIVITIS
☐ OTHER SPECIFY ______

SEXUALLY TRANSMITTED DISEASES:

☐ 087 GONORRHEA
☐ 538 NON-GONOCOCCAL URETHRITIS
☐ 04716 GENITAL HERPES VIRUS
☐ 086 SYPHILIS
☐ 08801 CHANCROID
☐ OTHER SPECIFY ______

SKIN:

☐ 094 FUNGAL INFECTION (TINEA)
☐ 615 PYODERMA/BOIL/ABSCESS/CARBUNCLE
☐ 640 ACNE
☐ 627 DERMATITIS/RASH
☐ 115 SCABIES
☐ 618 CELLULITIS
☐ 638 FOLLICULITIS
☐ 114 PEDICULOSIS
☐ 621 CYST
☐ 06902 WART
☐ 62608 HEAT RASH
☐ 63701 INGROWN TOENAIL
☐ OTHER SPECIFY ______

OTHER MEDICAL PROBLEMS:

☐ 012 ACTIVE CLINICAL TUBERCULOSIS
☐ 73710 FEVER OF UNDETERMINED ORIGIN
☐ 30605 GENERAL MALAISE/FATIGUE
☐ 738 HEADACHE
☐ 440 HEMORRHOIDS
☐ 507 HERNIA
☐ 047 HERPES SIMPLEX VIRUS
☐ 382 HYPERTENSION
☐ 917 IMMUNOLOGICAL REACTION
☐ 94209 MOTION SICKNESS
☐ 249 OVERWEIGHT
☐ DENTAL SPECIFY ______
☐ OTHER SPECIFY UNLISTED CONDITION ______

ACCIDENTS/TRAUMA

Show TYPE OF INJURY and INJURY LOCATION by filling the space to the left with the appropriate LETTER CODE from LOCATION LETTER CODES list

CODE	TYPE OF INJURY
___ 11	ABRASION
___ 12	BRUISE
___ 13	BURN (CHEMICAL)
___ 14	BURN (HEAT)
___ 15	FOREIGN BODY
___ 16	FRACTURE
___ 17	HEAT EXHAUSTION
___ 18	HEAT STROKE
___ 19	LACERATION
___ 20	POISONING
___ 21	PUNCTURE WOUND
___ 22	SPRAIN/STRAIN
☐ OTHER	SPECIFY ______

LOCATION LETTER CODES

A	SCALP	N	HAND
B	FACE	O	FINGER
C	EYE	P	BACK
D	EAR	Q	ABDOMEN
E	MOUTH	R	HIP/BUTTOCK
F	NECK	S	GROIN/GENITAL
G	CHEST	T	UPPER LEG
H	RIBS	U	KNEE
I	SHOULDER	V	SHIN/CALF
J	UPPER ARM	W	ANKLE
K	ELBOW	X	FOOT
L	FOREARM	Y	TOE
M	WRIST	Z	DOES NOT APPLY

III. TREATMENT PROVIDED (Check any that apply.)

☐ 01 COUNSELING
☐ 02 PRESCRIPTION(S) (# ____)
☐ 03 IMMUNIZATION(S) (# ____)
☐ 04 LAB TEST(S) (# ____)
☐ 05 X-RAY(S) (# ____)
☐ 06 SURGERY/SUTURE PROCEDURES
☐ 07 CAST/SPLINT/ACE WRAP
☐ 08 DRESSING
☐ 09 PHYSICAL EXAM
☐ 10 AUDIOGRAM
☐ 11 VISION SCREENING
☐ 12 ISSUE EARPLUGS
☐ 13 ORDER SPECTACLES
☐ 14 REFERRAL
☐ 15 OTHER ______

VISIT TYPE:
☐ 1 LIMITED SERVICE
☐ 2 OUTPATIENT
☐ 3 INPATIENT

IV. DISPOSITION

☐ 1 FULL DUTY
☐ 2 LIGHT DUTY (# days ____)
☐ 3 NO DUTY/SICK IN QUARTERS (# days ____)
☐ 4 EVACUATED
☐ 5 HOSPITALIZED

V. TUBERCULIN TESTING (Check any that apply.)

☐ 1 REACTIVE SKIN TEST
☐ 2 NEW-REACTOR
☐ 3 NONREACTIVE SKIN TEST
☐ 4 X-RAY SCREEN
☐ 5 X-RAY SCREEN ABNORMAL
☐ 6 PLACED ON INH
☐ 7 REACTION TO INH

FOR OFFICIAL USE ONLY

DATA CONTAINED HEREIN ARE SUBJECT TO THE PRIVACY ACT OF 1974. AFFORD PROTECTION IN ACCORDANCE WITH SECNAVINST 5211.5C

NOTE: AFTER COMPLETION, DETACH TOP PAGE AND USE BACK OF PAGE TWO FOR SF600 ENTRY. NHRC 6320.20 (11-86)

Figure 3. Outpatient Morbidity Reporting Form

MEDICAL SERVICES AND OUTPATIENT MORBIDITY REPORT
NAVMED 6300/1 (REV. 1-80) S/N 0105-LF-206-3006

REPORT SYMBOL MED 6300-1

NAME, ADDRESS, ZIP CODE OF FACILITY	FACILITY AND LOCATION CODE	REPORT PERIOD
USS BATTLESHIP FPO NEW YORK, N.Y 09582	xxxxxxxxx	JUL 1989

SECTION I - GENERAL WORKLOAD

	ACTIVE DUTY - U.S. UNIFORMED SERVICES			DEPENDENTS		
	A NAVY	B MARINE	C OTHER	D NAVY	E MARINE	F OTHER
01 OUTPATIENT VISITS	606	51				
02 INPATIENT VISITS						
03 ADMITTED TO QUARTERS	45	2				
04 QUARTERS PATIENT DAYS	45	2				

SECTION II - ADJUNCT SERVICES

	A OUTPATIENT	B INPATIENT		C OUTPATIENT	D INPATIENT
07 LABORATORY TEST(S)	56	0	PHARMACY UNIT(S)	7441	1
08 PULMONARY FUNCTION STUDY	0	0	X-RAY FILM EXPOSURE	366	0
09 AUDIOGRAM(S)	150	0	DIALYSIS PROCEDURE	0	0
10 COBALT/CESIUM	0	0	EEG	0	0
11 ECG	0	0	FLUOROSCOPIC EXAM	0	0
12 RADIOISOTOPE STUDY	0	0	RADIUM/RADIOISOTOPE THERAPY	0	0
13 OTHER DEEP THERAPY	0	0		0	0

SECTION III - OTHER SERVICES

			OPHTHALMOLOGY				MISCELLANEOUS		
	A REFRACTION MC	B REFRACTION NSC	C ORDER SPECTACLES (SINGLE)	D ORDER SPECTACLES (BIFOCAL)	E FABRICATE SINGLE VISION	F FLIGHT PHYSICAL EXAM	G OTHER COMPREHENSIVE PHYS	H IMMUNIZATION(S)	I LIMITED SERVICE
14	0	0	0	0	0	0	67	0	0

SECTION IV - SELECTED DATA / SECTION V - ACTIVE DUTY AVERAGE STRENGTH

SECTION IV - SELECTED DATA			SECTION V - ACTIVE DUTY AVERAGE STRENGTH		
A FETAL DEATH	B VASECTOMIES	C PEAK CENSUS	D NAVY	E MARINES	F OTHER
0	0	0	4720	300	0

SECTION VI - INDIVIDUAL CLINIC/SERVICE WORKLOAD

	A LIMITED SERVICES	B OUTPATIENT VISITS	C INPATIENT VISITS		D LIMITED SERVICES	E OUTPATIENT VISITS	F INPATIENT VISITS
16 ALLERGY	0	0	0	ANESTHESIOLOGY	0	0	0
17 CARDIOLOGY	0	0	0	CHEST DISEASE	0	0	0
18 DERMATOLOGY	0	0	0	EMERGENCY ROOM	0	0	0
19 ENDOCRINOLOGY	0	0	0	FAMILY PRACTICE	0	0	0
20 GASTROENTEROLOGY	0	0	0	GENERAL INTERNAL MED	0	0	0
21 GENERAL PRACTICE	0	0	0	GENERAL SURGERY	0	0	0
22 GYNECOLOGY	0	0	0	HEMATOLOGY	0	0	0
23 NEUROLOGY	0	0	0	NEUROSURGERY	0	0	0
24 OBSTETRICS	0	0	0	OCCUPAT THERAPY	0	0	0
25 OPHTHALMOLOGY	0	0	0	OPTOMETRY	0	0	0
26 ORTHOPEDICS	0	0	0	OTORHINOLARYNGOLOGY	0	0	0
27 PEDIATRICS	0	0	0	PHYSICAL THERAPY	0	0	0
28 PLASTIC SURGERY	0	0	0	PODIATRY	0	0	0
29 PROCTOLOGY	0	0	0	PSYCHIATRY	0	0	0
30 PSYCHOLOGY	0	0	0	THORACIC SURGERY	0	0	0
31 UROLOGY	0	0	0				

G.P.O.:1980-689-120/1097

Figure 4. Computer generated Monthly Morbidity Report

SECTION VII - OUTPATIENT MORBIDITY - ACTIVE DUTY NAVY AND MARINE CORPS PERSONNEL

	ITEM	NEW CASE A	RE-VISIT B
33	INFECTIVE & PARASITIC DISEASE	153	27
34	ACUTE GASTRNT/DIARRH/DYSENTER	16	4
35	GONORRHEA	4	0
36	SYPHILIS	0	1
37	GENITAL HERPES VIRUS	5	1
38	NONGONOCOCCAL URETHRITIS	10	5
39	OTHER SEXUALLY TRANSMITTED	2	0
40	EXTERNAL PARASITES	4	1
41	FUNGAL DISEASES/ATHLETE'S FT	68	13
42	OTHER INFECTIVE & PARASITIC	44	2
43			
44	NEOPLASMS	1	0
45			
46	ENDOCRINE/NUTR/METABOLIC	1	0
47			
48	BLOOD DISEASES	0	0
49			
50	MENTAL DISORDERS	1	0
51	ALCOHOLISM	0	0
52	MARIJUANA	0	0
53	NARCOTIC DRUGS	0	0
54	NON-NARCOTIC DRUGS	0	0
55	COMBINATION	0	0
56	OTHER MENTAL & BEHAVIORAL DIS	1	0
57			
58	NERVOUS SYSTEM & SENSE ORGAN	44	8
59			
60	CIRCULATORY SYSTEM DIS.	10	3
61			

ITEM	NEW CASE C	RE-VISIT D
RESPIRATORY SYSTEM DIS.	140	9
ACUTE RESPIRATORY DIS. (URI)	113	6
INFLUENZA SYNDROME	5	0
OCCUPATIONAL INHALATION DIS.	1	1
ALL OTHER RESPIRATORY DISEASE	21	2
DIGESTIVE SYSTEM DISEASES	34	3
GENITOURINARY SYSTEM DISEASES	4	2
COMP OF PREGNANCY/PUERPERIUM	0	0
SKIN & SUBCUTANEOUS DISEASES	104	36
CELLULITIS/PYODERMA/ABSCESS	11	3
OCCUPATIONAL DERMATITIS	15	9
HEAT RASH	19	4
NONOCCUP ALLERGIC DERMATITIS	1	0
MOLES/WARTS/CYSTS	5	1
ALL OTHER SKIN DISEASES	53	19
MUSCULOSKELETAL SYSTEM	22	3
CONGENITAL ANOMALIES	1	1
SIGNS/SYMPTOMS/ILL-DEFINED CO	40	13
GENERAL MALAISE/FATIGUE	0	1
HEADACHE	8	1
FEVER (UNDETERMINED ORIGIN)	2	0
ALL OTHER SIGNS AND SYMPTOMS	30	11

ITEM	NEW CASE E	RE-VISIT F
ACCIDENTS/POISONINGS/VIOLENCE	49	6
BATTLE CASUALTIES (BI)	0	0
ADVERSE EFFECTS OF NOISE	0	0
ADVERSE EFFECTS OF HEAT,LOCAL	1	0
ADVERSE EFFECTS OF HEAT,SYSTM	1	0
ADVERSE EFFECTS OF COLD	0	0
MOTION SICKNESS	0	0
MOTOR VEHICLE ACCIDENTS	0	0
OCCUPATIONAL INJURIES	18	1
OCCUPATIONAL POISONING	0	0
NONOCCUPATIONAL INJURIES	6	2
ADVERSE EFFECTS OF MEDICATION	0	0
OTHER ACCIDENTS/POISON/VIOL	0	1
FAMILY PLANNING/CONTRACEPTION	0	0
FAMILY CONTRACEPTION-FEMALE	0	0
FAMILY CONTRACEPTION-MALE	0	0
SUPPLEMENTARY CLASSIFICATIONS	11	2
TUBERCULIN TESTING		
SKIN TESTS READ	0	
SKIN TESTS REACTIVE	0	
SKIN TESTS CONVERTORS	0	
SKIN TESTS NONREACTIVE	0	
SCREENING X-RAYS	0	
SCREENING X-RAYS ABNORMAL	0	
PATIENTS PLACED ON INH	1	
REACTIONS TO INH	0	

REMARKS:

SIGNATURE AND TITLE [illegible] DATE SUBMITTED [illegible]

NAVMED 6300/1 (REV. 1-80) BACK

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

1a REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b RESTRICTIVE MARKINGS NONE
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(U) A STRATEGY FOR COMPUTING DISEASE AND NON-BATTLE INJURY RATES

12 PERSONAL AUTHOR(S)
W.M. PUGH

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17 COSATI CODES			18 SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
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19 ABSTRACT (Continue on reverse if necessary and identify by block number)

The Naval Health Research Center has initiated an effort to compute the Disease and Non-Battle Injury (DNBI) rates needed to determine the medical requirements for Navy and Marine Corps personnel afloat and ashore. A data base has been compiled which includes information on all hospital admissions since 1965, information on outpatient visits, monthly morbidity reports, service history data, environment data, and deployment information. In addition, more outpatient data are being collected with a Patient Encounter Report designed to document specific diagnoses, treatments, and the disposition of each patient. These data will be used to document current DNBI rates and project rates for situations where no data are available, to extrapolate geographic and temporal trends, and estimate the effect of different levels of combat intensity. The approach taken in this effort started by specifying the population in terms of a person's duty station. Therefore, determination of population strengths, which is often a problem, can be accomplished by extracting information from available service history records.

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